



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,708	12/03/2004	Takuo Funaya	Q85154	6730

23373 7590 01/18/2008
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

STONER, KILEY SHAWN

ART UNIT	PAPER NUMBER
----------	--------------

1793

MAIL DATE	DELIVERY MODE
-----------	---------------

01/18/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/516,708

Applicant(s)

FUNAYA ET AL.

Examiner

Kiley Stoner

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-13 and 15-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-13 and 15-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-13, 15-20, 33-34 and 37-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Blair et al. (U.S. 6,109,506).

When the ranges disclosed in the reference and claimed by applicant overlap in scope but the reference does not contain a specific example within the claimed range.

See the concurring opinion in *Ex parte Lee*, 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993).

Blair et al. teach a solder comprising zinc at 7 to 10 weight % both inclusive, bismuth at 0.001 to 6 weight % both inclusive, silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1, and the remainder of tin, said solder being lead-free (column 2, line 61-column 3, line 10; Tables 1 and 2; and claims 7, 8, 11 and 12), said solder is in the form of powder (column 2, line 52). The composition of Blair et al. would intrinsically have the claimed composition when melted. Blair et al. also teach that the solder comprises said silver at 0.001 to .08 weight % both inclusive (column 2, line 61-column 3, line 10; Tables 1 and 2; and claims 7, 8, 11 and 12), and said solder contains said silver at Z weight % ($0.025 \leq Z < 0.1$) (column 2, line 61-column 3, line 10; Tables 1 and 2; and claims 7, 8, 11 and 12).

With respect to claims 11-12 and 17-18, Blair et al. does not teach the diameter of the solder paste particles; however, the examiner take Official Notice that the claimed diameters are well know in the art.

With respect to claims 13, 19 and 20, Blair et al. teach that the solder is mixed with flux, but is silent with respect to the concentration of flux. It is the examiner's position that the amount of flux is a result effective variable that would be readily optimized to obtain an adequate bond. Thus, the claimed concentration of flux would have been obvious to one of ordinary skill in the art.

Claims 9-13 and 15-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoji et al. (US 2006/0071051 A1).

Shoji et al. teach an electronic component soldered to a board (paragraph 3) by soldering with a Pb free solder comprising up to 9% Zn, at least 0.05% Bi (paragraphs 13-16) and a combined impurity level of Ag among other elements of less than 1% in a balance of Sn (paragraph 34). Powder diameter is 1 to 20 microns (paragraphs 42 and 43). Solder is mixed with 8-14% flux (paragraph 24). However, the particular concentration of Ag is not disclosed. Even though Shoji et al. teach that the presence of Ag under 1 mass % does not adversely affect the characteristics of the solder metal, it is the examiner's position that one of ordinary skill in the art would be motivated to reduce the level of Ag impurity in order to form a pure solder alloy. A solder alloy with a lower concentration of impurities will more readily wet the materials being bonded. In addition, a high level of impurities could alter the melting temperature of the solder alloy. Thus, it would be desirable to one of ordinary skill in the art to form a solder alloy with a concentration of Ag within the claimed range of 0.001 to 0.1 weight %; 0.001 to 0.08 weight %; and silver at Z weight % ($0.025 \leq Z < 0.1$).

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments with respect to Shoji et al. have been fully considered but they are not persuasive for the reasons set forth in the above rejection. Additionally, it is the examiner's position that

the Takuo Funaya declaration does not establish persuasive evidence of unexpected results for improved tensile strength, breaking elongation, Vickers hardness, and shearing strength over the entire claim range(s). Thus, the declaration is not commensurate in scope with the claims. Furthermore, 1.132 declarations do not overcome anticipatory rejections.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

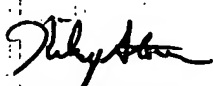
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

Application/Control Number:
10/516,708
Art Unit: 1793

Page 6

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 1/11/08

Kiley Stoner

Primary Examiner A.U. 1793